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# MANAGING SOUTHERN PINE FORESTS TO PRODUCE FORAGE FOR BEEF CATTLE

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Southern forests support many varieties of grasses and often yield enough forage to produce beef from grazing during portions of the timber rotation. However, sound, long-range planning and proper application of proven research results are needed. Planning can be divided into four steps:

1. Identify opportunities.
2. Determine the amount and quality of forage available.
3. Provide for supplemental feed.
4. Coordinate management activities.

## IDENTIFY OPPORTUNITIES

Forage yield is controlled by many factors. Grass production is greatest on the best soils, open-canopied forests or forests with many openings. As tree and shrub cover increases along with the accom-

panying needle and leaf accumulations, grass production decreases. Greatest yields can be expected from regeneration clear cuts, site-prepared or recently planted areas, and thinned pole or sawtimber stands. Additional increases can be expected when prescribed burning is carried out in suitable pine types.

For a quick estimate of forage available for cattle, take a walk over the tract to be considered for grazing and estimate the percentage of ground covered by grasses (both in openings and under trees and shrubs). If the average grass cover estimate is 25 percent or more, a good grazing opportunity may exist if sufficient acreage is involved (about 50 acres or more). Before proceeding with further measurements, the land manager or owner needs to consider these questions:

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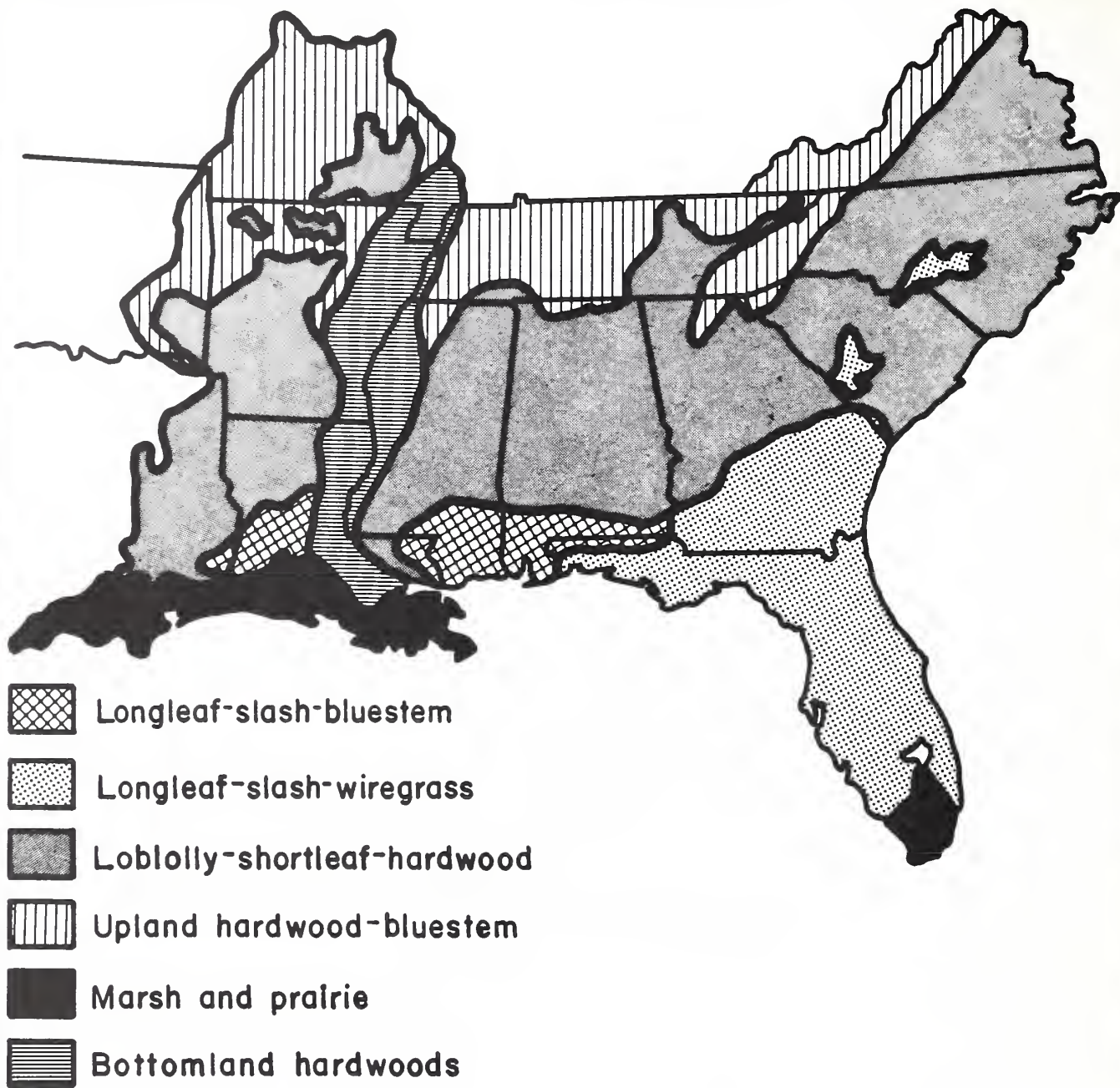


Figure 1. — Major range types of the South.\*

\*—from Range Resources of the South, Southern Section, Society for Range Management.

*1. Could a beef-timber operation fit in with my long-range objectives?*

The primary ownership or management objective is very important. Fences and/or other improvements require investments that usually can be recovered only after several years of profitable operation. Objectives such as developing recreation areas may require special coordination measures or additional

fences. Of course, objectives requiring dense timber stands will limit forage development considerably.

*2. Can I (or a lessee) economically provide needed fencing, gates, water, and supplemental feeding?*

Existing fences and water supplies may require only minimal maintenance. On the other hand, costs of new fencing, watering or handling facility



costs should be compared with expected returns from beef production. If fences can serve other resource needs such as land line identification or recreation, then costs can be prorated among the various resources. Keep in mind that hardwood stands under 10 feet tall and managed for commercial timber production must be fenced or protected from grazing to prevent damage.

**3. Do I have or can I provide the necessary improved pasture and/or supplemental feed needed to sustain cattle in winter months or emergency periods?**

Crude protein and phosphorus in native forage is lowest during the late fall and winter, and fails to meet cattle needs for good health, best growth and reproduction. Lactating cattle especially need supplemental feed to sustain weight. One of the best ways to provide this supplemental food is to combine native forage with some improved pasture for hay and/or emergency grazing. During the fall and winter, be prepared to feed hay, in addition to cottonseed cake or other high protein food. It takes about ½ acre of improved pasture to provide hay for each cow. See the local extension agent, Soil Conservation Service representative, or university specialist for information on the best supplemental foods for your area.

**4. Do I have (or do I have access to) the cattle and forage management knowledge needed to carry out a successful timber-grazing operation?**

Cattle and range management expertise may be obtained through prior experience of the owner or employees, technical assistance from consultants or government agencies, or by leasing grazing rights to a cattleman.

**5. My cattle are on improved pastures year-around but I have access to forest land. Do I want to expand cattle production or provide a grazing rest for improved pastures?**

Forest grazing can be used to rest improved pastures, provide a period for hay production in the spring and summer, or for roughage during the winter.

## DETERMINE AMOUNT AND QUALITY OF FORAGE AVAILABLE

Figure 1 will help to identify the probable range type for your area. Tables 1 and 2 can be used to estimate available forage for average southern pine forest conditions. Further estimates should be made after each grazing season to adjust future utilization to remove approximately 45 percent of annual forage yields.

In computing cattle stocking rates, use only areas accessible to livestock. Physical barriers such as impenetrable brush, very dense timber stands, lakes and ponds, and steep slopes should not be included in

**Table 1. — Livestock forage production for managed southern pine forest stands\***

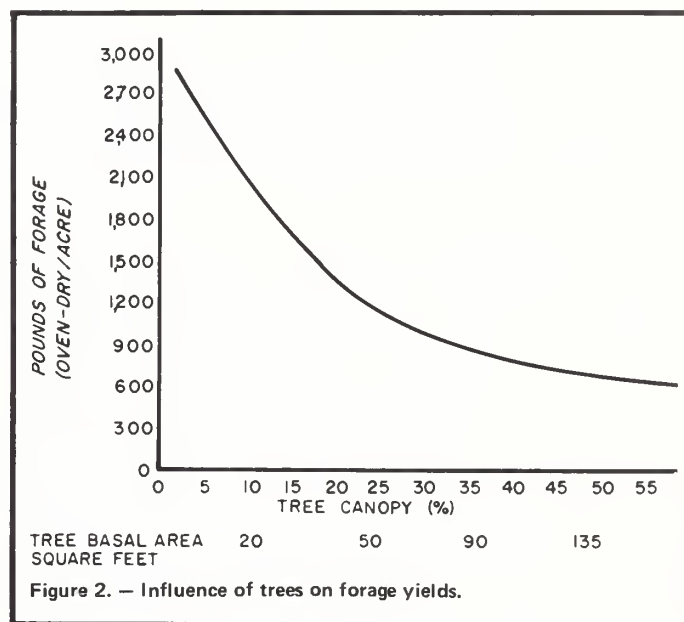
Stand size class	Forage production range Pounds/acre, air dry
Open-seedling & sapling stage	2,600 to 3,000
Saplings up to 6-inch dbh	1,400 to 2,600
Poles & very young sawtimber	650 to 1,400
Sawtimber	650 to 1,500

\*Production will vary depending on grass species, density of tree and shrub cover, and frequency of prescribed burning or other treatments which decrease competing vegetation.

**Table 2. — Suggested stocking (acres per cow) by grazing periods for average southern forest range conditions\***

Grass production pounds/acre, air dry	Months.....				
	3	5	7	9	12
500	20	34	56	60	80
1,000	10	17	23	30	40
2,000	5	8	12	15	20
3,000	3	6	8	10	13

\*Utilization is 45 percent of available forage.



acreage estimates. Commercial hardwood stands under 10 feet tall must be protected from grazing and therefore must also be excluded from forage estimates.

An important factor in forage yield is tree and cover density. See figure 2 for influence of tree canopy on forage production. Also, overhead shade frequently determines the relative abundance or scarcity of

species of native grasses present. For example, as the tree canopy becomes denser in loblolly-shortleaf pine types, the bluestem grasses become scarce and uniola grasses are prevalent.

Southern forest forage is usually deficient in amounts of nutrients needed for good animal growth. Figure 3 shows some typical trends in crude protein, phosphorus, and calcium by months of the year. Lactating cattle generally require a minimum of 7-8 percent crude protein, .18 percent phosphorus and .24 percent calcium in their diet to maintain good health and reproductive capacity. Without some supplemental feed it is obvious that animals will lose weight and vigor if dependent only on native forage.

### PROVIDE FOR SUPPLEMENTAL FEED

To overcome deficiencies in native forage, supplements must be provided for best weight gains and animal reproduction (figure 4). Some ways of providing this are through improved pastures, cottonseed meal or cake, steamed liquid supplement, and protein blocks.

Improved pasture supplementation may best be furnished on utility or other rights-of-way, permanent firebreaks, wildlife openings, or by widening of road shoulders. These areas must be maintained and fertilized annually for continued high production.

### COORDINATE MANAGEMENT PRACTICES

Forage production varies greatly with timber stand density and the presence or absence of dead pine needles, leaves, and other litter on the forest floor. Grazing systems have a large bearing on forage production and utilization limits. Season long use with light cattle stocking can overgraze a particular site whereas heavier use for shorter periods may be acceptable. Modification and proper timing of forest management activities can greatly enhance forage production and at the same time protect and improve the habitat of several wildlife species. To enhance forage production, the following guidelines should be considered:

#### Site Preparation and Release

- *When oak, hickory, and other hardwoods are present in the understory*, prescribe burn in the summer before planting or seeding pine. As needed, inject or spray competing hardwoods with herbicides to increase yields of native grasses. Where mechanical site preparation is desired, response of grasses is best from use of *light* preparation techniques such as single drum chopping in late spring or summer. Less grass usually is produced following *intensive* site preparation techniques such as windrowing and multiple chopping or disking. However, forb production increases for 1-3 years as the degree of site prepara-

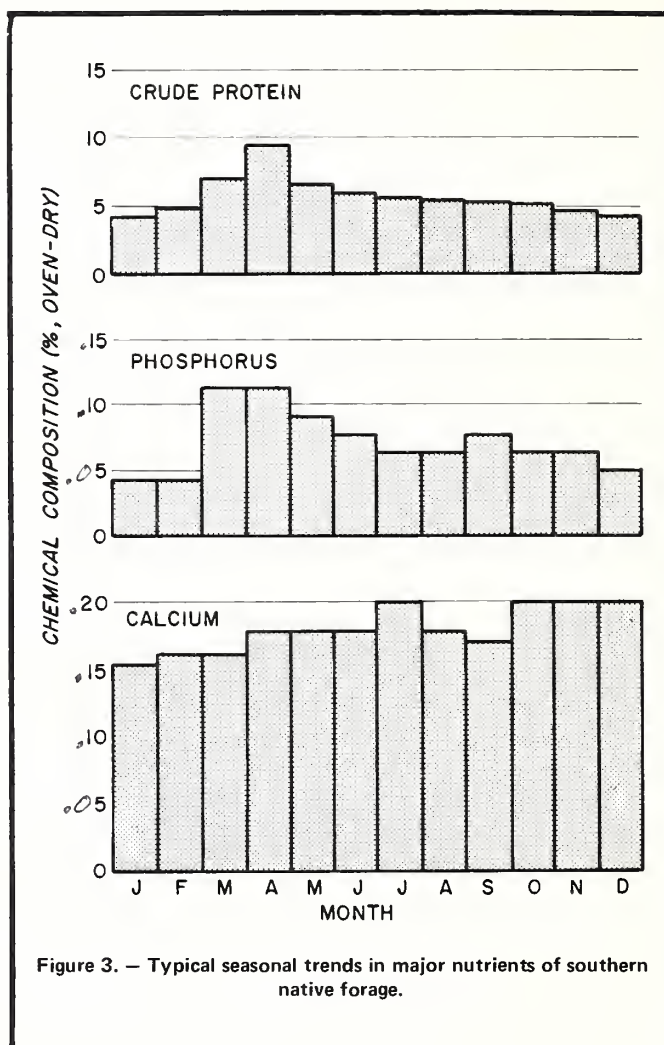
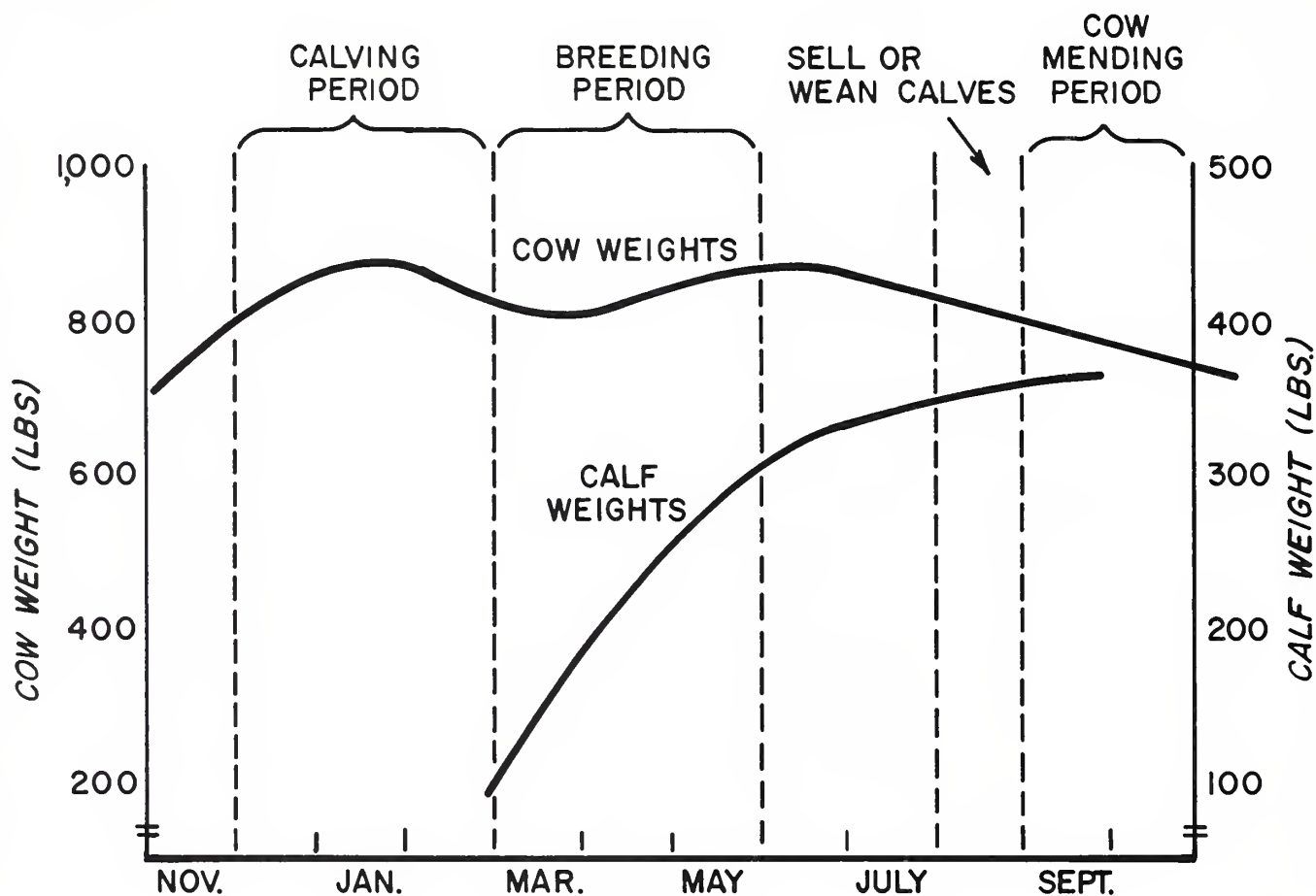


Figure 3. — Typical seasonal trends in major nutrients of southern native forage.

tion increases on most southern pine sites. Hardwood areas needed for wildlife mast or cover should be excluded from treated areas.

- *When gallberry and palmetto are present in the understory*, carry out a prescribed burn in the winter and/or single or double chop in the spring or summer, leaving enough roughage for wildlife food and cover. Before burning and site preparation, graze the area heavily to reduce competing vegetation and utilize available forage. Following site preparation, a rest from grazing for one growing season allows early establishment of desirable grasses.

- *When improved grasses are to be seeded or introduced*, prepare the site well, considering future maintenance such as fertilization and brush control. Where possible, double disk before seeding such grasses as bahia or fescue. These shade tolerant grasses can substantially increase production of forage in pine stands when properly established and managed. Stocking of cattle should be withheld and closely regulated until grasses and trees are well established



\_\_\_\_\_ GRASS DORMANT \_\_\_\_\_ LUSH GRASS PERIOD \_\_\_\_\_ GRASS MATURING \_\_\_\_\_  
 \_\_\_\_\_ Supplement range with hay or protein \_\_\_\_\_ Pasture Suppl. Period\* \_\_\_\_\_ Suppl. with hay fields  
 \_\_\_\_\_ FEED SALT AND MINERAL FREE CHOICE YEAR LONG \_\_\_\_\_

Figure 4. — Expected weight gains for a cow-calf operation on managed southern forest lands with supplemental feeding.

\*Desirable for both bluestem and wiregrass types, but necessary on pure wiregrass types during May-Aug. Pastures may be improved firebreaks, roadsides, etc.

(usually for second year after tree planting). Consult local experts for fertilizer rates.

#### Tree Planting or Seeding

Space tree seedlings at wide row intervals (7' x 12' x 14', or greater) for highest and longer lasting production of grasses combined with wood production. Light cattle stocking can usually be tolerated from the time of planting if sufficient forage is available;

however, cattle should be removed during the winter months of the initial planting or seeding year. Thereafter, stocking can be adjusted by measurement and observation of forage production and use. Where direct seeding is used, reduce seeding rates to obtain a fairly open stand. Row seeding gives best control of tree density. Precommercial thinning of closely spaced pines will usually be needed (with the possible exception of longleaf pine) early in the life of the stand to promote forage production. If fertilization is



planned for timber production in newly established pine plantations, managers should carefully consider introducing improved, shade-tolerant grasses, such as bahia and fescue, to fully benefit from the fertilization. The best time for this is immediately following site preparation.

### Thinning

Where possible secure whole tree, chipper-harvesters. Harvesting that takes as much wood and debris as possible from the area or shreds it and puts it on the ground is best for forage production. When this equipment is not available, carry out a prescribed burn in following year if the supply of roughage permits. Also, burn in advance of cutting. Pre-commercially thin all dense stands to 600 or less well-spaced seedlings per acre. Thereafter, thin frequently and heavily to a 50-70 square foot basal area when markets permit. If possible, harvest timber while cattle are off the range to prevent straying of cattle and reduce fence maintenance.

### Regeneration Cuts

Cater to markets and purchasers of stumpage offering equitable stumpage prices and as complete removal of merchantable and unmerchantable tree material as possible.

Avoid excessive soil loss, rutting of soil, or compaction in harvesting.

When possible, harvest all timber on an area in a single year to avoid excessive growth of hardwood sprouts during harvest delays. Consider forage and wildlife needs in design of regeneration clearcuts and in stocking rates.

### Prescribed Burning

Prescribed fire is a useful tool to improve availability, desirability and nutrient quality of native forage for livestock as well as many species of wildlife. Native grasses of southern pine forests can usually tolerate any type of prescribed burn whether back, head, strip, or flank. Late winter burns are best for forage because grass regrowth occurs fairly soon. Begin prescribed burns when trees are 10-15 feet tall; then burn at 3-year intervals in pine-bluestem types and at 2-year intervals in the wiregrass types. Spring or summer burns can reduce brush competition in sawtimber stands, but such burns should be carefully planned and conducted to avoid damage to wildlife habitat and other resources. Where possible, rest prescribed burns for 4 to 6 weeks before beginning grazing because cattle usually concentrate on fresh burns.

### Fertilization

Response by native forage to fertilization for forage production does not justify the cost. When fertilizing for timber production, native grasses also respond in

varying degrees, thus providing some benefit to cattle using the area.

### Firebreaks and Rights-of-Way

Plan and construct firebreaks and road systems for implementing periodic prescribed burns, gaining access, and providing cattle distribution. Prepare sites and plant grass species best adapted to your area; then fertilize and maintain annually to get greatest grass production. Widening of firebreaks, woods, road shoulders, or other rights-of-way, can expand forage supply to supplement native range.

## COORDINATE OTHER USES AND VALUES

Wildlife, watershed, recreation and other uses of forest land in addition to range and timber will require special consideration in planning and applying management practices. Recommendations for stocking in this publication are moderate and consider some use of forage by wildlife.

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